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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,898	02/20/2004	Srinivas Bollapragada	52493.000362	4222
6147 7590 01/22/2009 GENERAL ELECTRIC COMPANY GLOBAL RESEARCH PATENT DOCKET RM. BLDG. K1-4A59 NISKAYUNA, NY 12309				
EXAMINER WONG, ERIC TAI WAI				
ART UNIT		PAPER NUMBER		
3693				
NOTIFICATION DATE		DELIVERY MODE		
01/22/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/781,898

Applicant(s)

BOLLAPRAGADA ET AL.

Examiner

ERIC T. WONG

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-13,15-19 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-13,15-19 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 5-8, 15, 17-19, and 22 rejected under 35 U.S.C. 103(a) as being unpatentable over Zitzler ("Comparison of Multiobjective Evolutionary Algorithms: Empirical Results").

Regarding claims 1, 17, and 22,

Zitzler teaches a method for multi-objective optimization based on competing objectives and a plurality of constraints, the method comprising: generating an initial population of solutions in a computing device to substantially cover a solution space having a plurality of dimensions defined by the competing objectives and the plurality of constraints; performing a first multi-objective process, based on the initial population and the competing objectives to generate a first interim efficient frontier in a solution space having at least two dimensions; performing a second multi-objective process, based on the initial population and the competing objectives to generate a second interim efficient frontier in a solution space having at least two dimensions; fusing the interim efficient frontier with the second interim frontier to create a fused efficient frontier (see pg. 182, section 6.2).

Zitzler teaches generating multiple Pareto sets for each algorithm being compared and fusing them into a single Pareto front by removing the dominated solutions from the joined set (see pg. 182, section 6.2). However, Zitzler teaches restricting to only two objectives in order to investigate the simplest case first. Therefore, Zitzler does not explicitly teach a solution space having at least three dimensions. However, it would have been obvious to one of ordinary skill in the art to extend the method of Zitzler to include a solution space having at least three dimensions since multi-objective optimization involving at least three dimensions was known in the art at the time of invention and the only reason Zitzler restricted to two objectives was for simplicity.

Zitzler does not explicitly teach that the competing objectives and plurality of constraints constitute a portfolio problem. The types of competing objectives and plurality of constraints constitute nonfunctional descriptive material because the method of Zitzler would operate the same with any multi-objective optimization problem. Further, the recitation that the fused efficient frontier is for use in investment decisions is a statement of intended use. Therefore, the limitations directed to the competing objectives and plurality of constraints constituting a portfolio problem are not given any patentable weight.

Regarding claim 2,

Zitzler teaches wherein the generating the initial population of solutions uses a combination of linear programming and sequential linear programming algorithms (see pg. 182).

Regarding claims 3 and 18,

As discussed above in regards to claim 1, the types of competing objectives constitute nonfunctional descriptive material and are not given any patentable weight.

Regarding claims 5 and 19,

Zitzler teaches wherein the initial population of solutions includes multiple feasible points (see pg. 182).

Regarding claim 6,

Zitzler teaches wherein the multiple initial feasible points are generated by solving linear programs (see pg. 182).

Regarding claim 7,

Zitzler teaches wherein the linear programs utilize randomized parameters (see pg. 182).

Regarding claim 8,

As discussed above in regards to claim 1, the competing objectives constitute nonfunctional descriptive material and are not given any patentable weight.

Regarding claim 15,

Zitzler teaches wherein a dominance filter process is applied on the fused efficient frontier to create a global efficient frontier (see pg. 191).

3. Claims 9-13 rejected under 35 U.S.C. 103(a) as being unpatentable over Zitzler in view of Hauskrecht ("Linear Program Approximations for Factored Continuous-State Markov Decision Processes").

Regarding claims 9-13

Zitzler teaches wherein the generating the initial population of solutions of portfolio allocations includes generating portfolios with different combinations of competing values. In regards to claims 9-10, the types of competing objectives constitute nonfunctional descriptive material and are not given any patentable weight.

Zitzler does not teach wherein the generating solutions with different combinations of competing values are performed by adding additional competing value constraints to a linear program corresponding to the objectives of the competing values; wherein solutions with substantially all feasible combinations of the competing values are generated by modifying parameters of the added competing value constraints; and wherein nonlinear constraints are approximated with linear constraints generated by a sequential linear programming.

Hauskrecht teaches wherein generating solutions with different combinations of competing values are performed by adding additional competing value constraints to a linear program corresponding to the objectives of the competing values; wherein solutions with substantially all feasible combinations of the competing values are generated by modifying parameters of the added competing value constraints; and wherein nonlinear constraints are approximated with linear constraints generated by a sequential linear programming (see pp. 2-3, conclusions).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the method of Zitzler with wherein the generating solutions with different

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combinations of competing values are performed by adding additional competing value constraints to a linear program corresponding to the objectives of the competing values; and wherein solutions with substantially all feasible combinations of the competing values are generated by modifying parameters of the added competing value constraints. One skilled in the art would have been motivated to make the modification for efficiency.

Response to Arguments

4. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC T. WONG whose telephone number is 571-270-3405. The examiner can normally be reached on Monday-Friday 9:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James A. Kramer can be reached on 571-272-6783. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James A. Kramer/
Supervisory Patent Examiner, Art Unit 3693

ERIC T. WONG
Examiner
Art Unit 3693

January 13, 2009